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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,599	01/20/2004	Stephen R. Van Doren	200313613-1	1105
22879 7590 12/11/2009 HEWLETT-PACKARD COMPANY Intellectual Property Administration 3404 E. Harmony Road Mail Stop 35 FORT COLLINS, CO 80528			EXAMINER CHERY, MARDOCHEE	
			ART UNIT 2186	PAPER NUMBER
			NOTIFICATION DATE 12/11/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM  
ipa.mail@hp.com  
laura.m.clark@hp.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,599	<b>Applicant(s)</b> VAN DOREN ET AL.	
	<b>Examiner</b> MARDOCHEE CHERY	<b>Art Unit</b> 2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9-12,15-17,19,21-28 and 30 is/are rejected.
- 7) ☒ Claim(s) 2,8,13-14,18,20,29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/12/09</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on August 12, 2009 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 16, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Glasco (2005/0251626).

As per claim 1, Glasco discloses a system comprising: a first node that includes an ordering point for data [par. 45, ll 1-3], the first node being operative to employ a

Art Unit: 2186

write-back transaction associated with writing data back to memory [par. 116, ll 5-8], the first node broadcasting a message to at least one other node in the system in response to an acknowledgement provided by the memory indicating that the ordering point for the data has migrated from the first node to the memory [par. 87, ll 11-16; pars. 120-123].

As per claim 16, the rationale in the rejection of claim 1 is herein incorporated.

As per claim 23, the rationale in the rejection of claim 1 is herein incorporated.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 9 and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by Gharachorloo et al. (Architecture and Design of AlphaServer GS320; Western Research Laboratory).

As per claim 9, Gharachorloo discloses a computer system, comprising: a first processor that provides a write-back request to transfer an ordering point for desired data from associated cache of the first processor to memory [Figs. 1, 2, 3, 4; page 2, left column, ¶ 2, page 4, top left column; Section 4.2, ¶ 2]; the memory providing an

Art Unit: 2186

acknowledgement back to the first processor in response to the write-back request [Figs. 1, 2, 3; Section 3.2, ¶ 2], the first processor providing a source broadcast write-back request to the system in response to the acknowledgement provided by the memory [Figs. 1, 2, 3; Section 3.2, ¶ 2]; and at least one other processor in the system that provides an acknowledgement response to the first processor in response to the source broadcast write-back request provided by the first processor [Figs. 1, 2, 3; Section 3, ¶ 3; Section 3.3, ¶ 3-4].

As per claim 10, Gharachorloo discloses wherein the system employs a source broadcast protocol, the system further comprising a third node that issue a source broadcast request for the desired data, the third node reissuing the request in response to recognizing a conflict associated with the source broadcast request for the desired data [Fig. 3; Table 4; ¶ 5-6].

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5-6, 19, and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glasco (2005/0251626) in view of Rowlands (2003/0217236).

As per claim 5, Glasco discloses a third node that issues a source broadcast request for the data employing a source broadcast protocol [par. 127].

However, Glasco does not specifically teach the third node retrying the source broadcast request for the data in response to recognizing a conflict associated with the source broadcast request for the data as required.

Rowlands discloses the third node retrying the source broadcast request for the data in response to recognizing a conflict associated with the source broadcast request for the data [pars. 57 and 113] to write back a remote cache block that is being evicted from the node (par. 65).

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Glasco to include a third node retrying the source broadcast request for the data in response to recognizing a conflict associated with the source broadcast request for the data because this would have facilitated writing back a remote cache block that is being evicted from the node (par. 65) as taught by Rowlands.

As per claim 6, Glasco discloses the conflict is recognized by the third node in response to one of (i) receiving the write-back message broadcast by the first node while the source-broadcast request for the data is active at the third node, or (ii) receiving a conflict response from the first node to the source broadcast request issued by the third node [par. 127].

As per claim 19, the rationale in the rejection of claim 5 is herein incorporated.

As per claim 27, the rationale in the rejection of claim 5 is herein incorporated.

As per claim 28, the rationale in the rejection of claim 6 is herein incorporated.

8. Claims 3-4, 7, 11, 12, 15, 17, 21-22, 24-25, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glasco (2005/0251626) and Gharachorloo et al. (Architecture and Design of AlphaServer GS320; Western Research Laboratory).

As per claim 3, Glasco discloses the claimed invention as discussed above, but does not explicitly disclose the at least one other node provides a response to the first node acknowledging receipt of the write-back message broadcast by the first node.

Gharachorloo discloses the at least one other node provides a response to the first node acknowledging receipt of the write-back message broadcast by the first node [page 4, top of left column].

Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the system of Glasco to include the at least one other node provides a response to the first node acknowledging receipt of the write-back message broadcast by the first node because doing so would have helped with

Art Unit: 2186

maintaining a valid copy of the data at the owner until the home acknowledges the writeback (Section 3.2, ¶ 2) as taught by Gharachorloo.

As per claim 4, Gharachorloo discloses the first node maintains the write-back transaction active until the first node receives responses from the at least one other node to the write-back message broadcast by the first node [page 4, top of left column].

As per claim 7, Gharachorloo discloses wherein the third node retries the source broadcast request employing a forward progress protocol [Page 3, section 3, pars. 4-5].

As per claim 11, Glasco discloses wherein the conflict is recognized by the third node in response to one of (i) receiving the source broadcast write-back request provided by the first node while the source-broadcast request for the desired data is active at the third node, or (ii) receiving a conflict response from the first node to the source broadcast request issued by the third node [¶ 127].

As per claim 12, Gharachorloo discloses wherein the third node reissues the request employing a forward progress protocol implemented in the system [Page 3, section 3, pars. 4-5].

As per claim 15, Gharachorloo discloses wherein the state that defines the cache line as the ordering point for the desired data is selected from a group consisting of a



Art Unit: 2186

modified state, an owner state and a dirty state, the cache line transitioning to an invalid state after issuing the write-back request to the memory [Fig. 2; Section 3.3, ¶ 4].

As per claim 17, Gharachorloo discloses means at each of at least one node in the system for acknowledging receipt of the source broadcast write-back message [page 4, top of left column].

As per claim 21, Gharachorloo discloses wherein the state that defines the cache line as the ordering point for the data is selected from a group consisting of a modified state, an owner state and a dirty state, the cache line transitioning to an invalid state after issuing the write-back request to the memory [Fig. 2; Section 3.3, ¶ 4].

As per claim 22, Gharachorloo discloses means for transitioning a cache line in the associated cache to an invalid cache state for the data after the write-back request is issued [Fig. 2; Section 3.3, ¶ 4].

As per claim 22, Glasco discloses means for transitioning a cache line in the associated cache to an invalid cache state for the data after the write-back request is issued [par. 87, ll 11-16; par. 120].

As per claim 24, the rationale in the rejection of claim 3 is herein incorporated.

As per claim 25, Gharachorloo discloses maintaining a write-back transaction at the first processor node until the first processor node receives the responses to the source broadcast message from the other nodes [page 4, top of left column].

As per claim 30, Gharachorloo discloses transitioning the state of the data in the first processor from a first state to an invalid state after issuing the write-back request to the memory, the first state being selected from a group consisting of a modified state, an owner state and a dirty state [Fig. 2; Section 3.3, ¶ 4].

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glasco (2005/0251626) and Gharachorloo et al. (Architecture and Design of AlphaServer GS320; Western Research Laboratory), and Van Doren (6,202,126).

As per claim 26, Glasco and Gharachorloo do not explicitly disclose retiring the write-back transaction at the first processor node in response to receiving the responses from each of the other nodes acknowledging receipt of the source broadcast message.

Van Doren discloses retiring the write-back transaction at the first processor node in response to receiving the responses from each of the other nodes acknowledging receipt of the source broadcast message [col. 3, lines 10-31].

Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to modify the system of Gharachorloo and Glasco to include retiring the write-back transaction at the first processor node in response to receiving

Art Unit: 2186

the responses from each of the other nodes acknowledging receipt of the source broadcast message because doing so would have helped with ensuring that the victim data buffer is retained until the victim data has been written back to memory and until all probes have been able to retrieve a copy of the data to return to the requesting CPUs (col. 3, lines 24-30) as taught by Van Doren.

### ***Allowable Subject Matter***

10. Claims 2, 8, 13-14, 18, 20, 29, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARDOCHEE CHERY whose telephone number is (571)272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on (571)272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2186

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mardochee Chery/  
Examiner, Art Unit 2188

December 2, 2009